

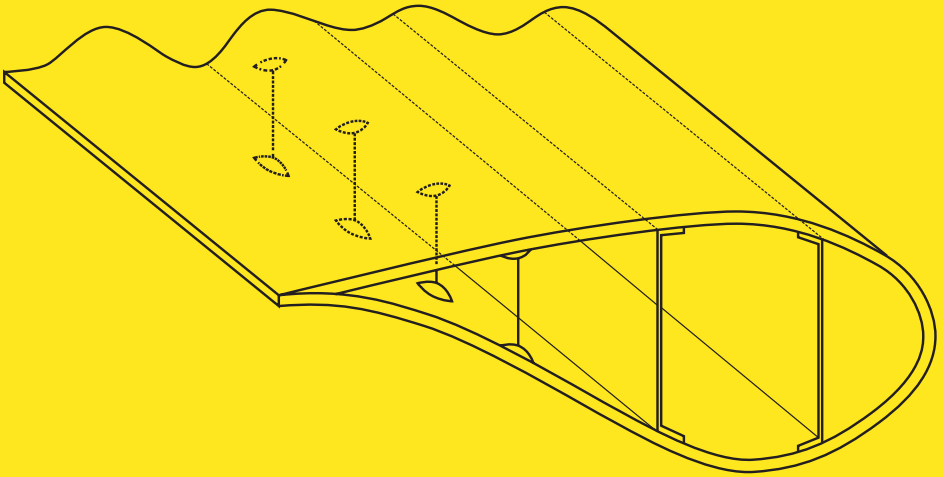


**Bladena**

BLADE ENABLER

# D-String<sup>®</sup>

## Installation Manual



# Toolset & D-String®

Measuring tape	Screwdriver S/M (flat headed)	Prof. Scissors	Compressed air + IPA and cloth
Manual dispensing adhesive gun + glue and tube	Steel brush	Tape	Finishing product

*NB! Drill 5mm hole if not there initially ...*

Glass fiber rod (2m)

**Power tool**  
+ drills and saws


Provided by Bladena		ø5 mm drill		Not provided by Bladena
		ø12 mm drill		
		ø44 mm Hole saw		
		Countersink		Tension scale

**Knots**

<b>Figure-of-eight</b>	<b>Bowline</b>
 1 2	 1 2
 3 4	 3 4

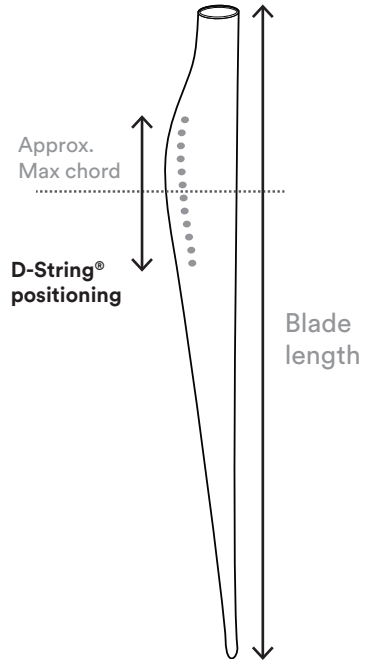
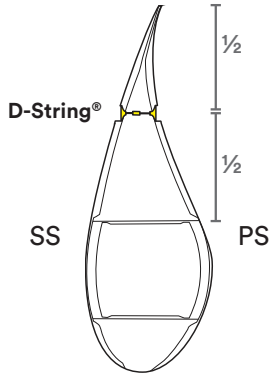
**D-String®**  
2 cones +  
1 string w. fuse

Cone I      Fuse      String      Cone II



Provided by Bladena

# Positioning the D-String®



## Table

#

DISTANCE FROM ROOT - BLADE LENGTH

DISTANCE FROM TE

mm

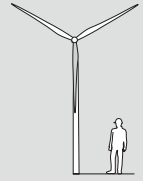
ft

mm

ft

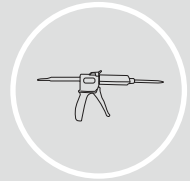
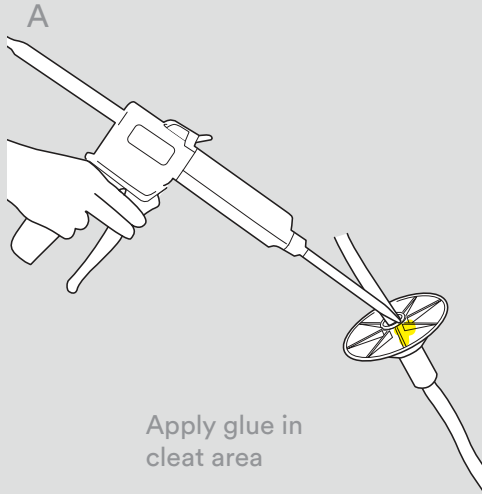
A large dashed rectangular box intended for recording data from the table.

# Instruction for installation

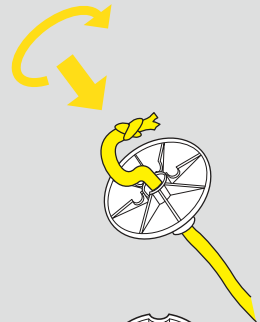
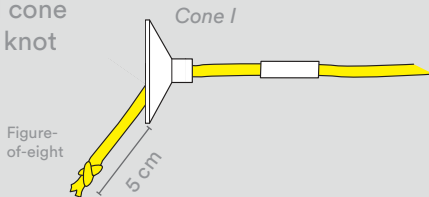


on ground

## 1 Ground preparation



B  
Add cone and knot

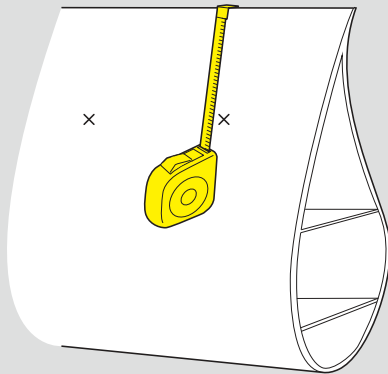


C  
Place string and fill cone with glue

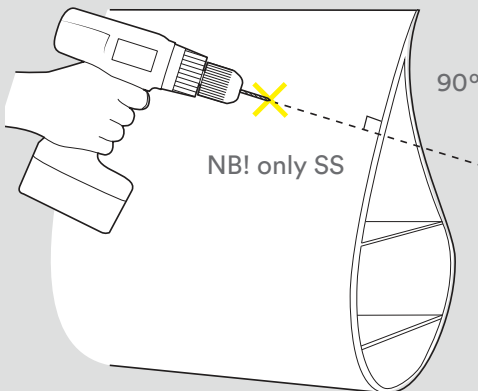




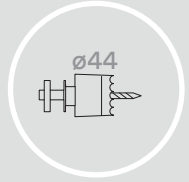
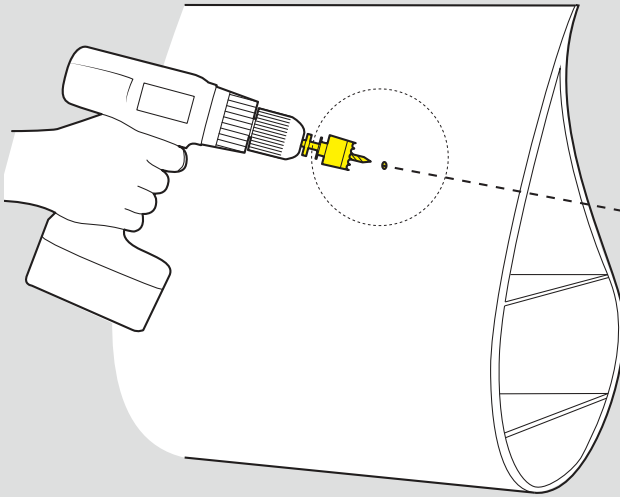
## 2 Mark position on suction side



## 3 Pre-drill blade using $\varnothing 5$ mm drill



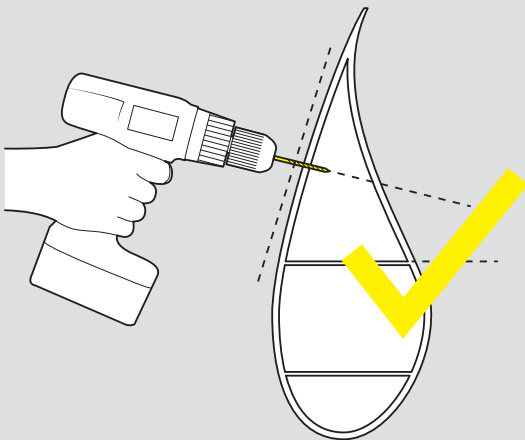
## 4 Drill using hole saw $\varnothing 44$



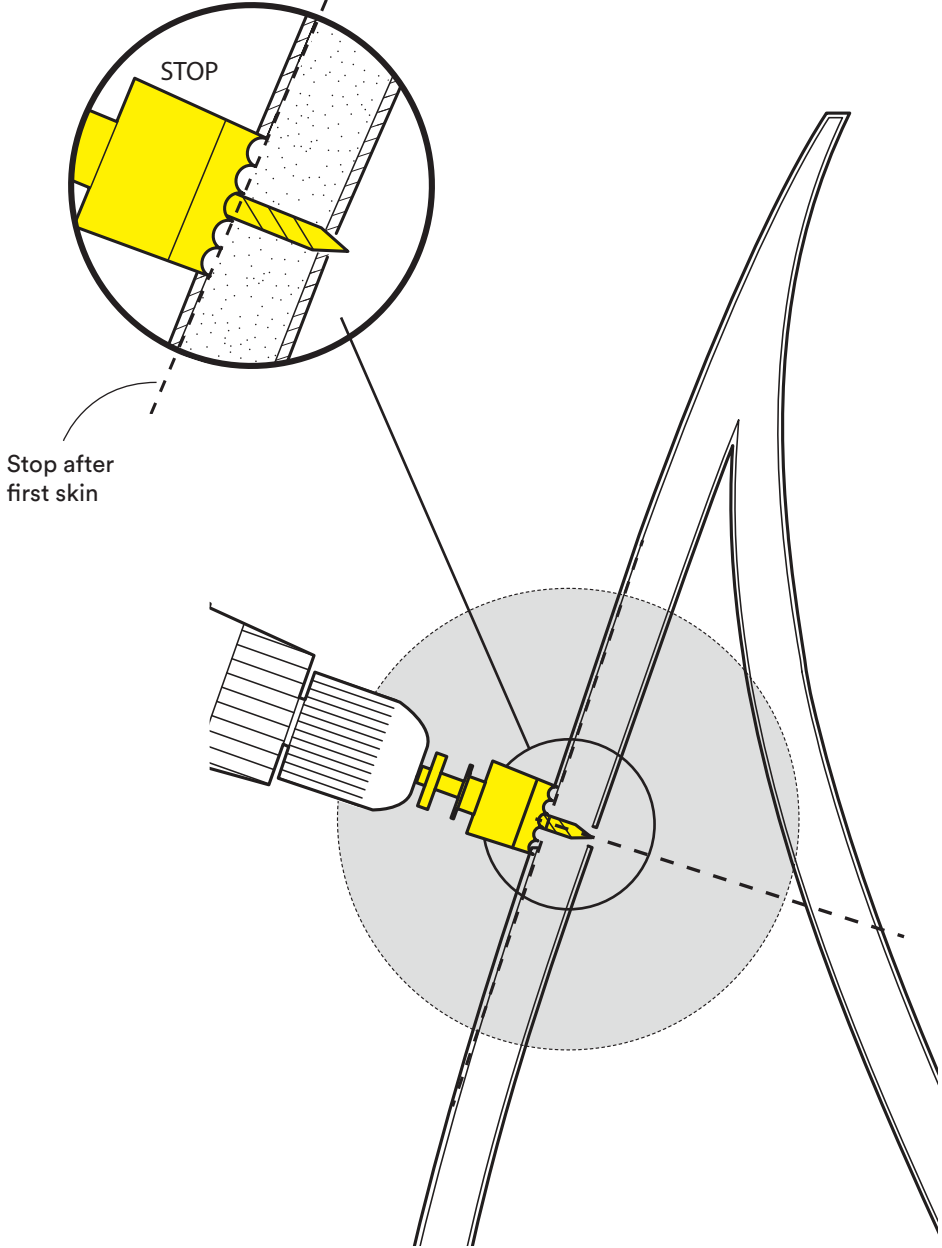
Continued on p. 7



## 5 Enlarge center holes

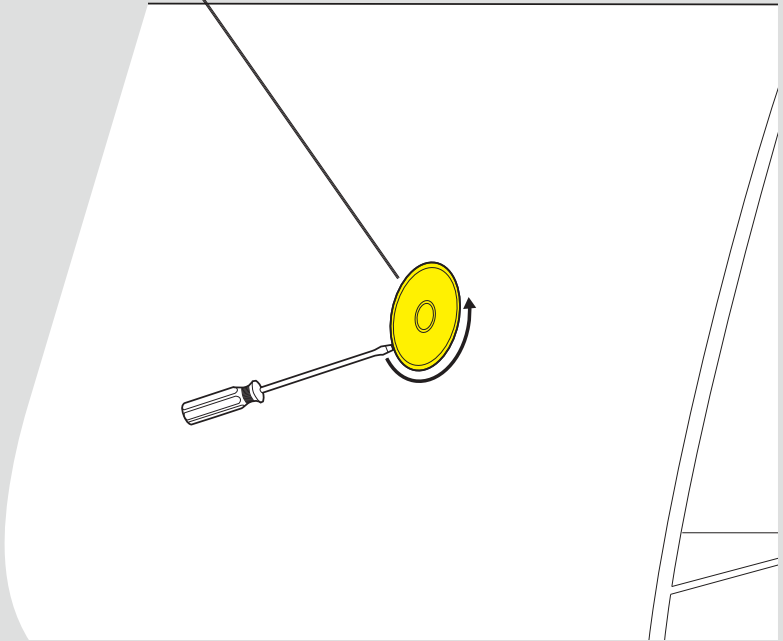
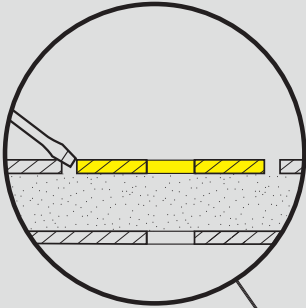
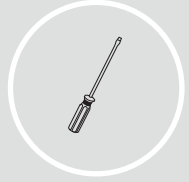


**NB!** Only light pressure



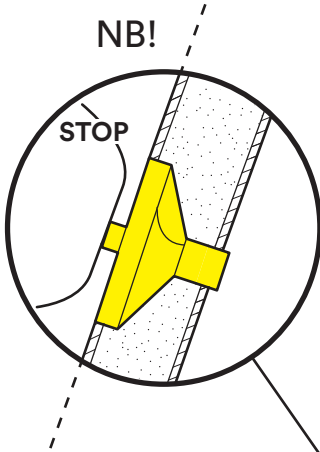
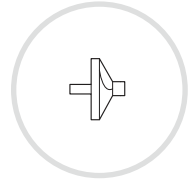
Stop after  
first skin

# 6 Remove outer skin

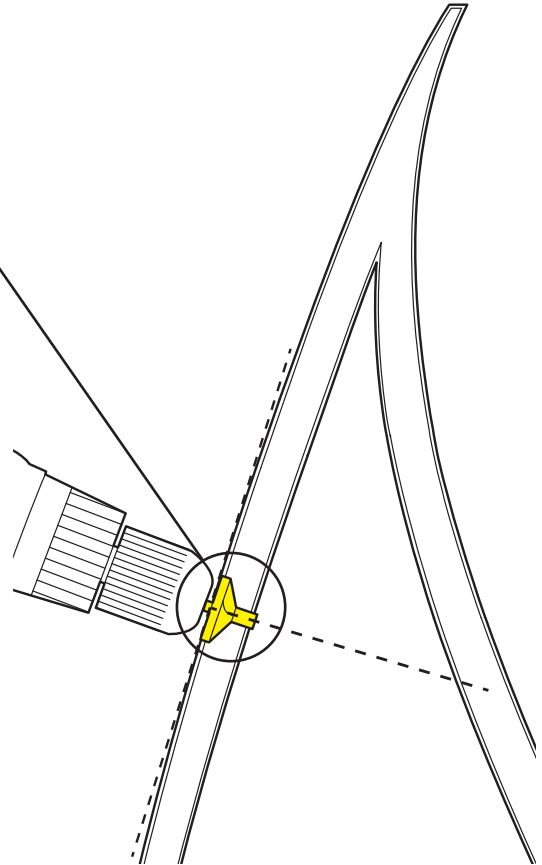
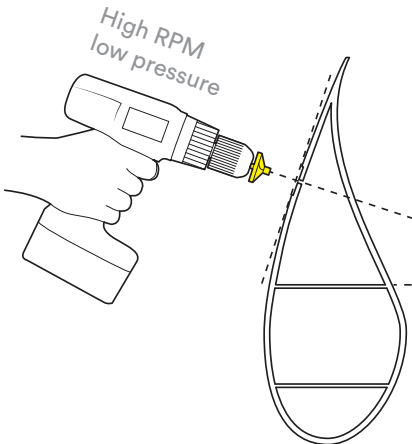


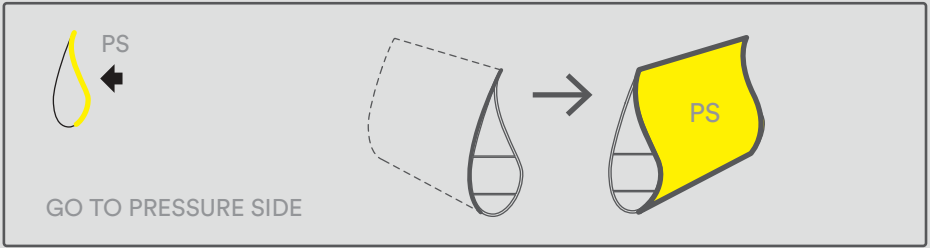


# 7 Countersink



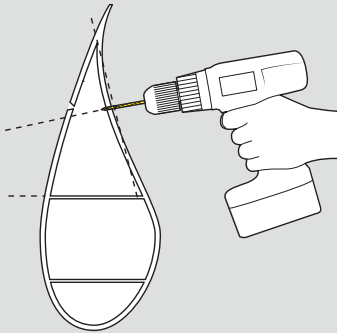
When core material gets stuck in the diamond coating, use steel brush to clean



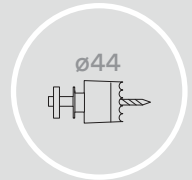
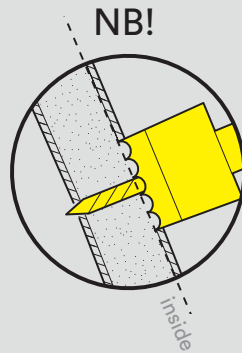
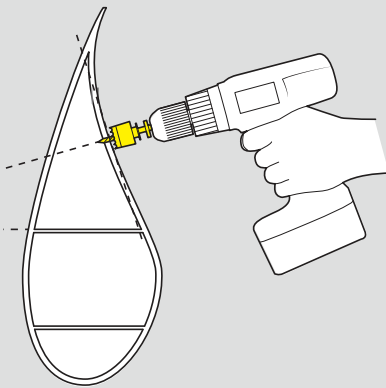


*Repeat process on pressure side*

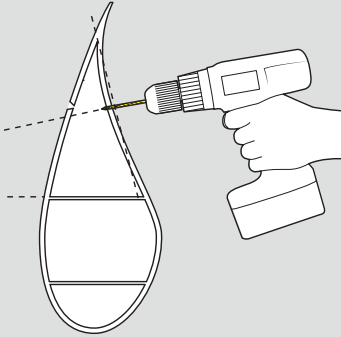
## 8 Pre-drill using $\varnothing 5$



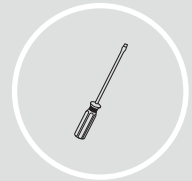
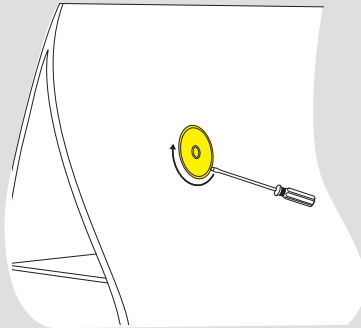
## 9 Drill using hole saw $\varnothing 44$



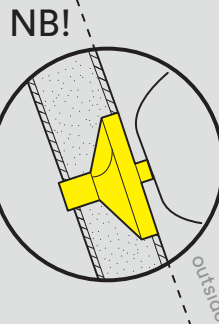
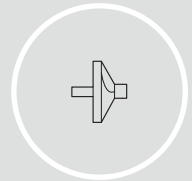
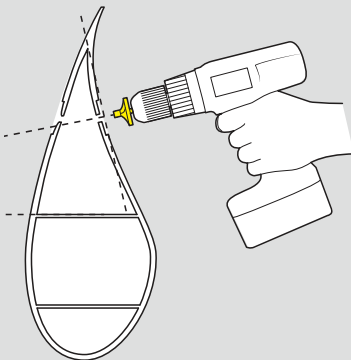
# 10 Enlarge center hole



# 11 Remove outer skin



# 12 Countersink

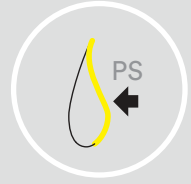
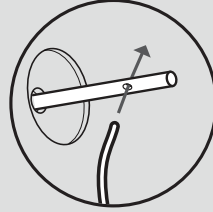
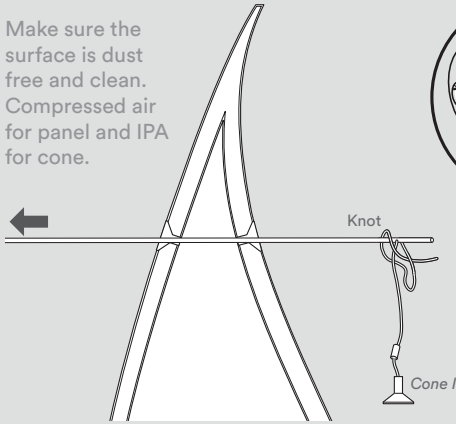


When core material gets stuck in the diamond coating, use steel brush to clean

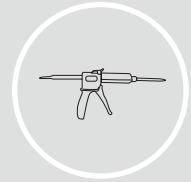
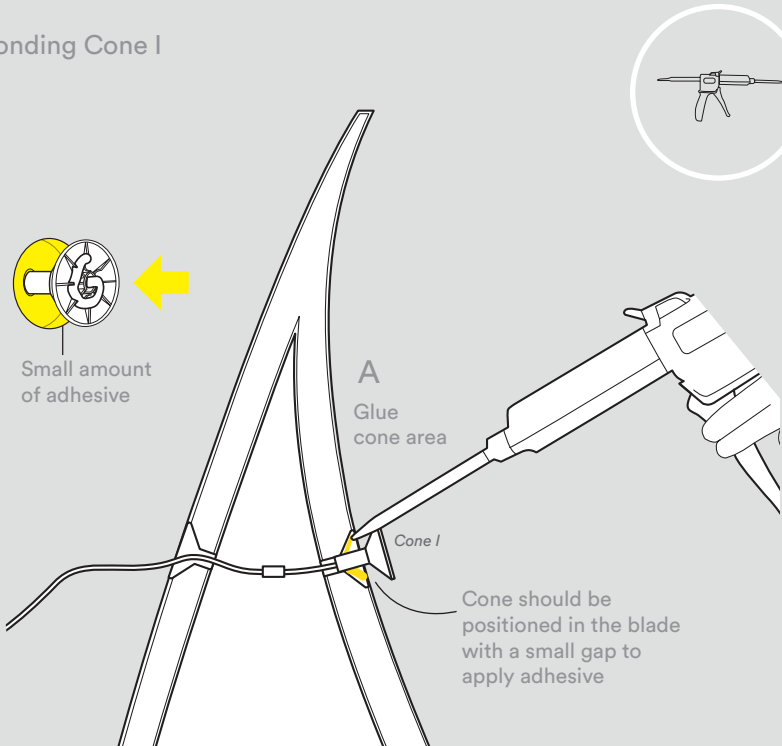
Stay on pressure side

## 13 Threading the string

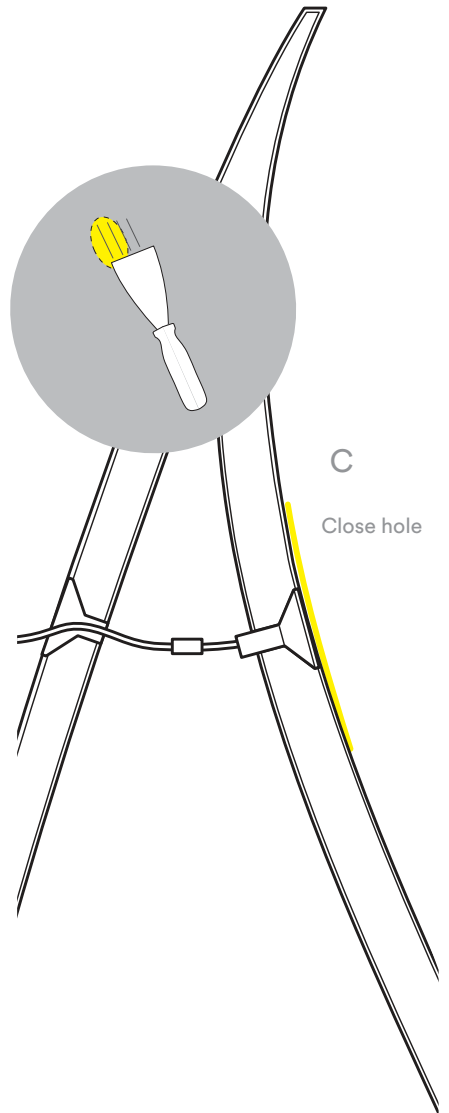
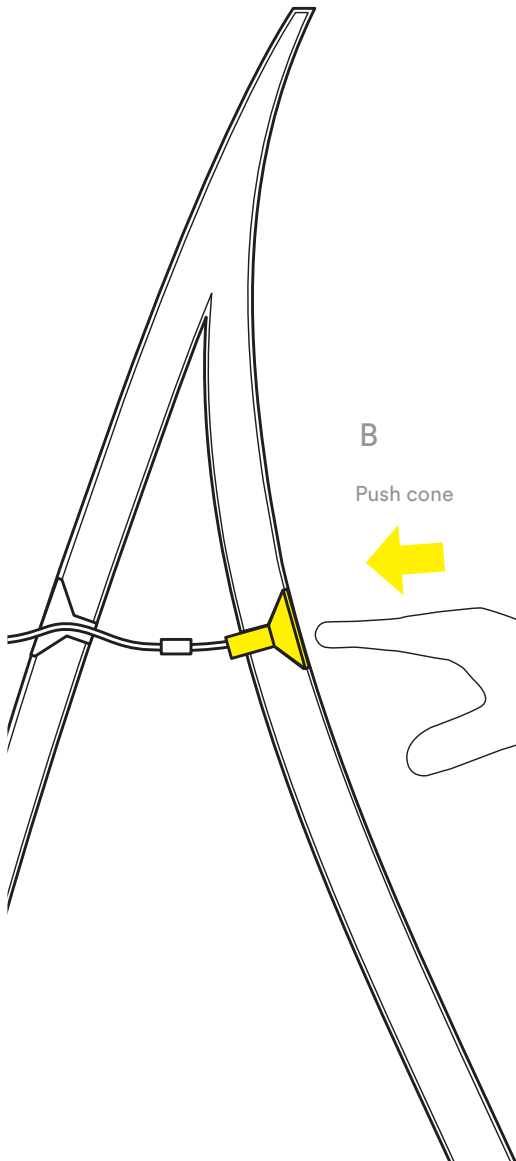
Make sure the surface is dust free and clean. Compressed air for panel and IPA for cone.

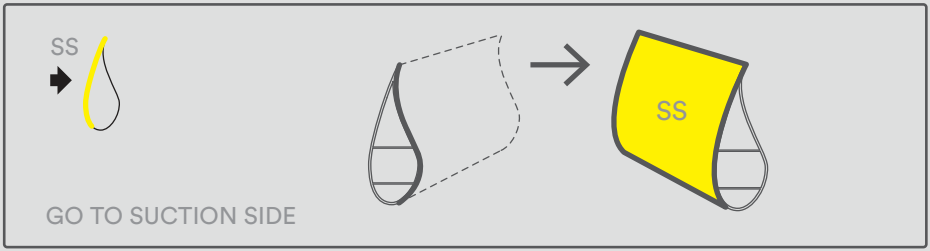


## 14 Bonding Cone I

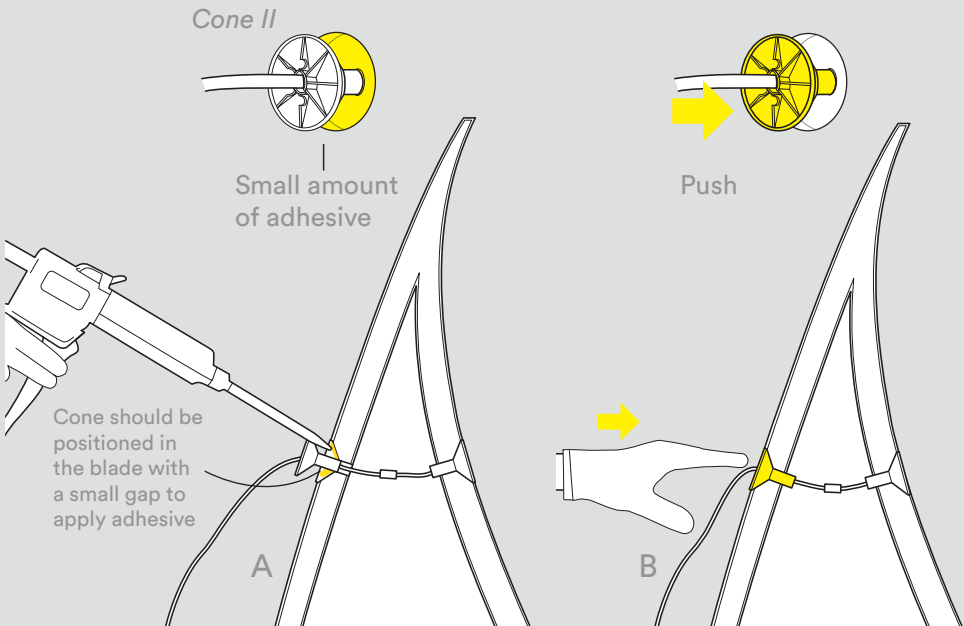
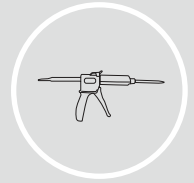


(step 14 continued)

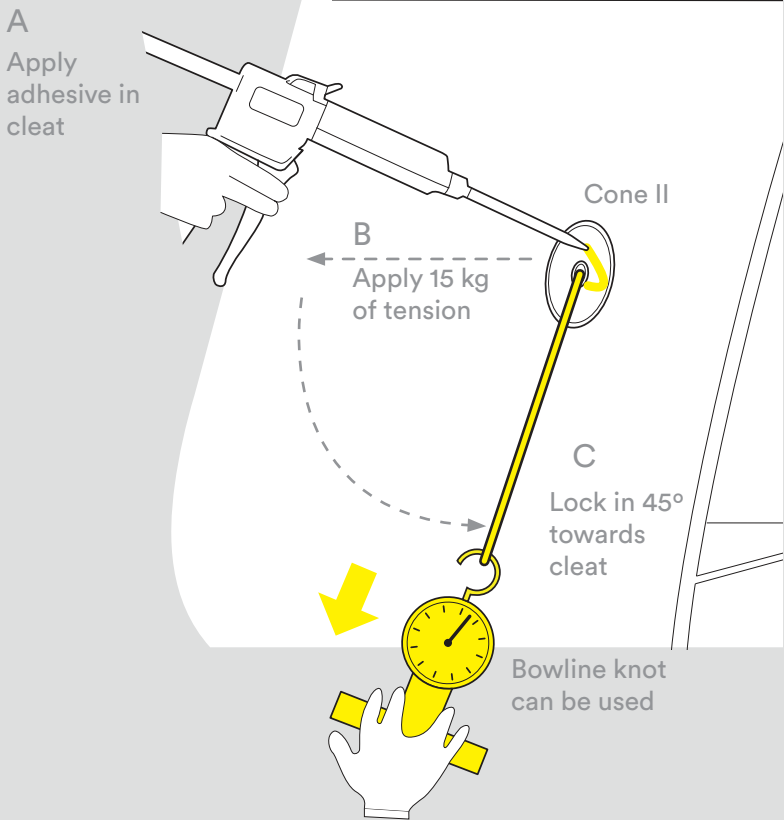
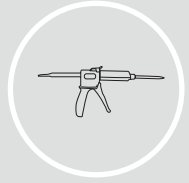




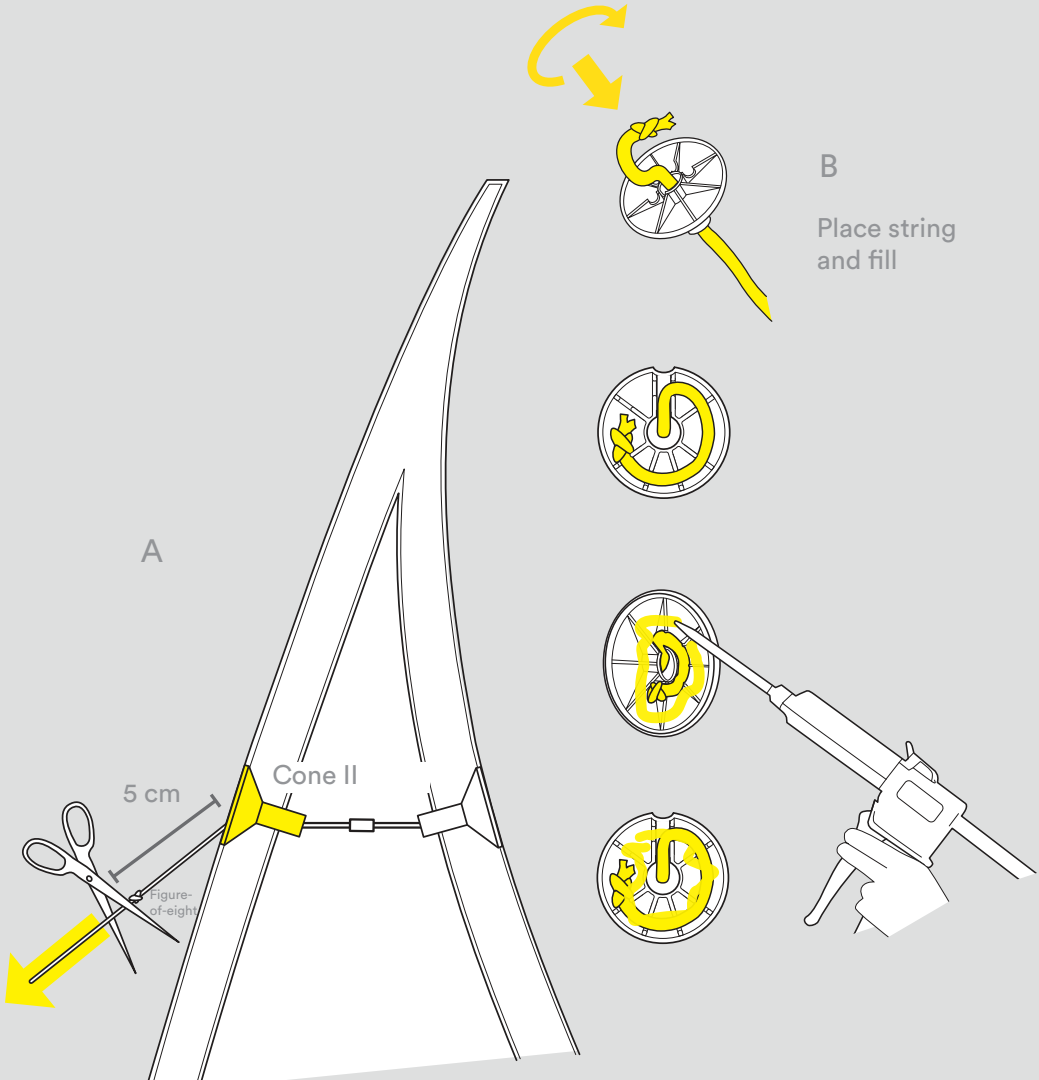
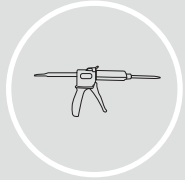
# 15 Bonding cone II



# 16 Adhesive in cleat & correct tension

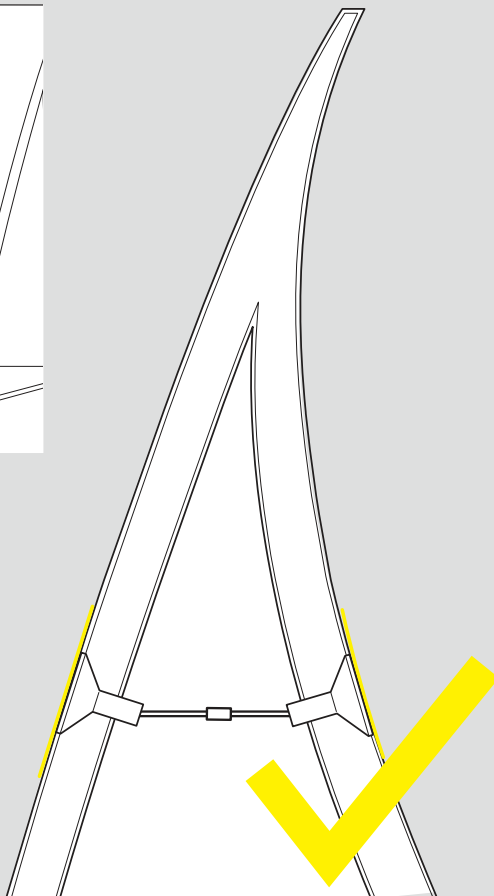
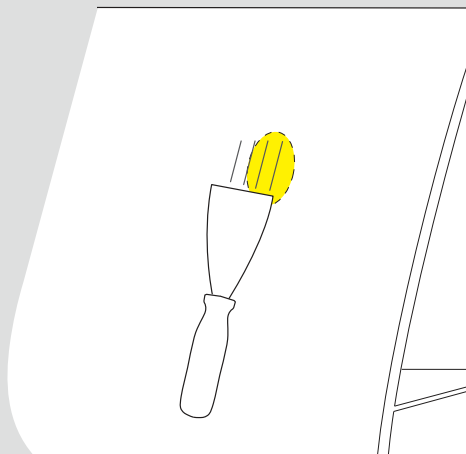


# 17 Position and tie knot

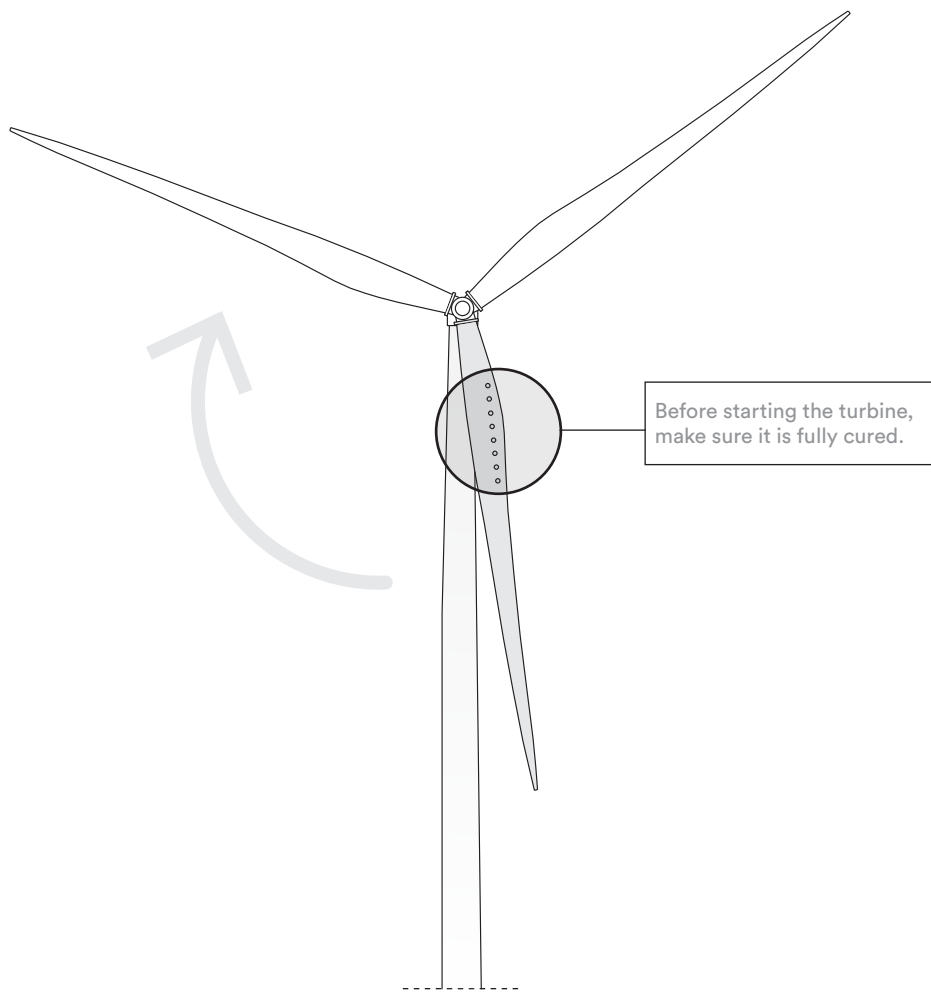




# 18 Close hole (SS)



# 19 Last step before moving on



# Technical support

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ES  
lue@bladena.com

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*For up tower installation  
use attached one-pager*



## Be aware

The access to the blade shell and general safety measures regarding working conditions with wind turbine generators are not covered in this document. It is a specific and specialised service that Bladena does not provide. Bladena rely solely on the skills, expertise and know-how of third party blade service teams, and would not in any case recommend technics or working condition that are outside of the accepted state of the art. The work that has to be undertaken is well understood by the technicians and deemed to be safe. Any operation that might compromise the safety of personnel or properties should not be undertaken. All access to the blade has to be done in accordance with the guidelines and instructions provided by the provider of this service.

## Design by



**KIRT x THOMSEN**  
Visual R&D Consultancy

# ”The D-String® does not affect the structural safety of trailing edge panels of a general rotor blade design”

Expert opinion by DEWI OCC

The D-String® has a significant impact on the anticipated lifetime of your blades.

The D-String® decrease the LCoE thus increasing the profit margin.

Return on investment of 1 year for offshore turbines and 1,3 years for onshore turbines!

**Want to talk more about your blades**  
Simply contact Bladena